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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|------------------------|---------------------|------------------|
| 10/520,131 | 10/05/2005 | Margherita Fontana | Q85649 | 6980 |
| 23373 7590 04/10/2008 SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037 | | | | |
| EXAMINER HO, ANTHONY | | | | |
| ART UNIT 2815 | | PAPER NUMBER | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,131

Applicant(s)

FONTANA ET AL.

Examiner

ANTHONY HO

Art Unit

2815

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-23, 32-38, 40 and 41 is/are pending in the application.
- 4a) Of the above claim(s) 11-13, 33-38, 40 and 41 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-10, 14-23 and 32 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 January 2005 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 14, 2008 has been entered.

Drawings

The drawings filed on January 3, 2005 are acceptable subject to correction of the informalities indicated on the attached "Notice of Draftsperson's Patent Drawing Review," PTO-948. In order to avoid abandonment of this application, correction is required in reply to the Office action. The correction will not be held in abeyance.

Specification

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Objections

Claims 2 and 16 are objected to because of the following informalities: For examination purposes, please replace "...gate insulator layer wherein the semiconductor channel..." in claim 1 with "...gate insulator layer, wherein the semiconductor channel..." For examination purposes, please replace "said metal atoms is independently on of Pt, Pd, Au, Ag, Ni, Cu" in claim 16 with "said metal atoms is independently one of Pt, Pd, Au, Ag, Ni, Cu" or other appropriate language. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-10, 14-16, 18-23 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nagel (US Patent 4,826,774).

In re claims 2 and 32, Nagel discloses a metal complex that comprises a chain of cations and anions, wherein each anion and cation comprises a metal atom and the ions are bonded such that charge carriers of the metal atoms are delocalized along the chain and method of forming the same in a semiconductor device such as a chemical field effect transistor (Abstract; column 4 – column 7).

The examiner takes "official notice" of the fact that a chemical field effect transistor comprises source and drain electrodes connected by a semiconductor channel, and a gate electrode capacitively coupled to the semiconductor channel via a gate insulator layer.

In re claim 3, Nagel discloses the ions are bonded to each other by means of the metal atoms (Abstract; column 4 – column 7).

In re claim 4, Nagel discloses each ion comprises a metal atom and ligands linked to the metal atom (Abstract; column 4 – column 7).

In re claim 5, Nagel discloses each ion is substantially planar (Abstract; column 4 – column 7).

In re claims 6-10, Nagel discloses the ligands comprise an alkyl chain (Abstract; column 4 – column 7).

In re claim 14, Nagel discloses the anions and cations are the same as each other (Abstract; column 4 – column 7).

In re claim 15, Nagel discloses the length of the chain be in the range from 10 to 10,000 ions (Abstract; column 4 – column 7).

In re claims 16, Nagel discloses the metal ions comprises the listed materials (Abstract; column 4 – column 7).

In re claims 18-22, Nagel discloses the ligands comprise the listed moieties (Abstract; column 4 – column 7).

In re claim 23, Nagel discloses the material is soluble (Abstract; column 4 – column 7).

Claims 2-10, 14-23 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kunugi et al (US Patent 6,160,267) in view of Papadimitrakopoulos (US Patent 5,946,550).

In re claims 2 and 32, Kunugi et al discloses a metal complex that comprises a chain of cations and anions, wherein each anion and cation comprises a metal atom and the ions are bonded such that charge carriers of the metal atoms are delocalized along the chain and method of forming the same in a semiconductor device (Figure 1; column 3 – column 6).

Papadimitrakopoulos discloses a transistor comprises source and drain electrodes connected by a semiconductor channel, and a gate electrode capacitively coupled to the semiconductor channel via a gate insulator layer, wherein the semiconductor channel includes a semiconductor material of a metal complex (Figure 6; Figure 7; column 8 – column 13).

The advantage is to obtain a transistor that has remarkable film-forming uniformity (column 2).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the metal complex as taught by Mann et al with a transistor comprises source and drain electrodes connected by a semiconductor channel, and a gate electrode capacitively coupled to the semiconductor channel via a gate insulator layer, wherein the semiconductor channel includes a semiconductor material of a metal complex as taught by Papadimitrakopoulos in order to obtain a transistor that has remarkable film-forming uniformity.

In re claim 3, Kunugi et al discloses the ions are bonded to each other by means of the metal atoms (Figure 1; column 3 – column 6).

In re claim 4, Kunugi et al discloses each ion comprises a metal atom and ligands linked to the metal atom (Figure 1; column 3 – column 6).

In re claim 5, Kunugi et al discloses each ion is substantially planar (Figure 1; column 3 – column 6).

In re claims 6-10, Kunugi et al discloses the ligands comprise an alkyl chain (Figure 1; column 3 – column 6).

In re claim 14, Kunugi et al discloses the anions and cations are the same as each other (Figure 1; column 3 – column 6).

In re claim 15, Kunugi et al discloses the length of the chain be in the range from 10 to 10,000 ions (Figure 1; column 3 – column 6).

In re claims 16-17, Kunugi et al discloses the metal ions comprises the listed materials (Figure 1; column 3 – column 6).

In re claims 18-22, Kunugi et al discloses the ligands comprise the listed moieties (Figure 1; column 3 – column 6).

In re claim 23, Kunugi et al discloses the material is soluble (Figure 1; column 3 – column 6).

Response to Arguments

Applicant's arguments with respect to claims 2 and 32 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Mann et al (US Patent 5,766,952)

- b. Nagel (US Patent 4,834,909)
- c. Stone et al (US Patent 4,098,807)
- d. Kagan et al (US Patent 6,646,285)

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ANTHONY HO whose telephone number is (571) 270-1432. The examiner can normally be reached on M-Th: 10:30AM-9:00PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Parker can be reached on 571-272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/A. H./
Examiner, Art Unit 2815
/Kenneth A Parker/
Supervisory Patent Examiner, Art Unit 2815